

Nutrition and Health

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Introduction

- ‘Nutrition’- the science of food and its relationship to health.
- The word nutrient or “food factor” is used for specific dietary constituents such as proteins, vitamins and minerals.
- Dietetics is the practical application of the principles of nutrition; it includes the planning of meals for the well and the sick.
- Good nutrition means “maintaining a nutritional status that enables us to grow well and enjoy good health.”

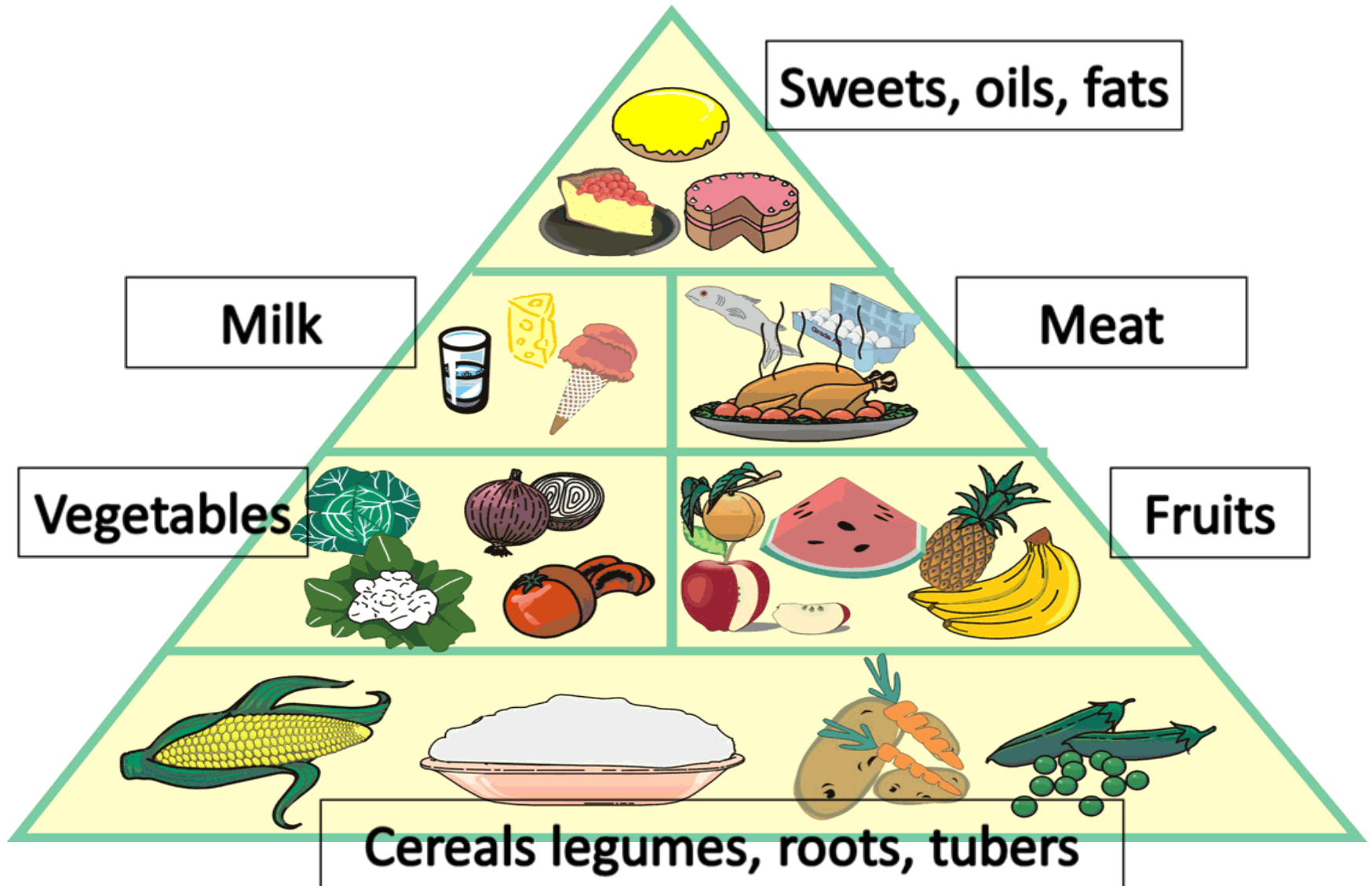
Classification of foods

- ***Classification by:***
 - ***Origin***
 - ***Chemical composition***
 - ***Predominant function***
 - ***Nutritive value***

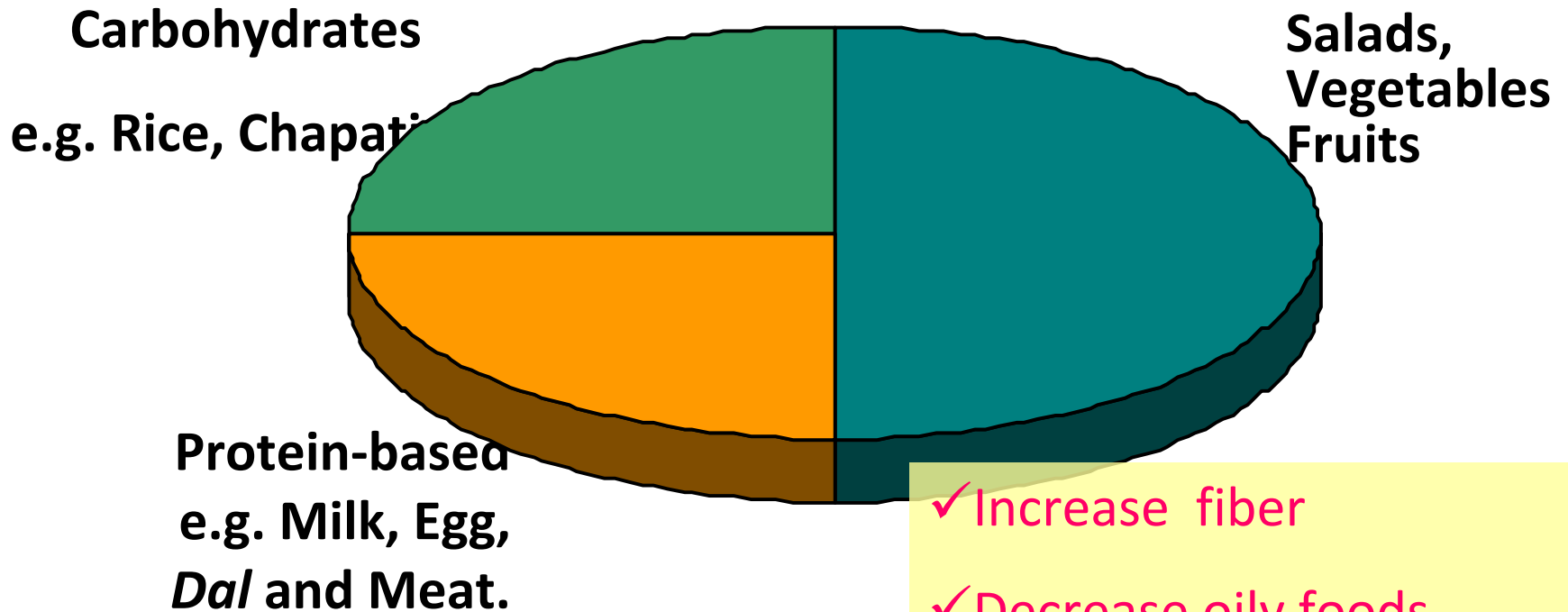
Nutrients

- **Organic and inorganic complexes contained in food.**
- **They are broadly divided in to:**
 - **Macronutrients:**
 - **Proteins**
 - **Fats**
 - **Carbohydrates**
 - **Micronutrients:**
 - **Vitamins**
 - **Minerals**

Food Pyramid



Healthy Diet



- ✓ Increase fiber
- ✓ Decrease oily foods
- ✓ 'No' to soft drinks

Recommended Dietary Allowances or Intakes (RDA or RDI)

- The RDA of a nutrient is the amount (of that nutrient) sufficient for the maintenance of health in nearly all people.
- These are the estimates of nutrient intakes which individuals in a population group need to consume to ensure that the physiological needs of all subjects in that population are met.
- It is an estimate that corresponds to mean intake of the given nutrient + 2 Standard Deviation.
- It is not used for defining the energy requirement, as any excess of energy intake is as undesirable as its inadequate intake. Hence for defining the RDA of energy only the average requirement is considered.

Can the RDA be Applied to Individuals?

- If all the students in a class of 100 were to eat food exactly as per their RDA about half would loose and the other half would gain weight, to the extent of being seriously undernourished or obese after a year!
- It is because the RDA for energy is a catering average; individuals however consume as per their appetite, which follows their energy expenditure.
- The RDA can therefore, not be used as standard to determine whether or not a given individual's requirement of a nutrient has been met.

CARBOHYDRATES

- Major and immediate source of energy.
- Complex carbohydrates recommended
- High-sugar foods preferred
- Grains, cereal, vegetables

FATS

- Source of essential fatty acids.
- Unsaturated fats e.g. Corn, bean, oils contain unsaturated
- Saturated fats increase cholesterol levels.
- Visible & Invisible fats.
- Hydrogenation
- Trans fatty acids

PROXIMATE PRINCIPLES

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- About 20 different amino acids which are found in human body.
- 9 a.a. are termed "essential".
- Pulses, lentils, soya, dairy products and animal food products.
- Supplementary action of Proteins

Iron

- Anemia is most common nutritional deficiency in adolescents and during pregnancy.
- Green leafy vegetables, jaggery, wet dates, whole-grain, dried beans, peas & dried fruits, nuts & fortified wheat products, eggs, red meat etc.

Zinc

- Second most abundant trace mineral in the body. (next to iron)
- Necessary for normal growth.
- Green leafy vegetables, wheat germ, whole grains meat, cheese,

Calcium

- Most bone mass acquired during adolescence.
- Typical intake of calcium = about 800 mg/ d
- Daily need = 1300 mg
- Consumption of soft drinks & caffeine contribute substantially to low calcium intake in adolescents.
- Bone mass deficiency may is irreversible.
- Milk and its products, yogurts, cheese, paneer, banana.

<i>Fat Soluble Vitamins</i>				
Vitamin	Function	RDA	Deficiency	Sources
Vitamin A (Retinol, Retinal, Carotenes, Cryptoxanthines)	Vision, Integrity of epithelium, Gene regulation, Antioxidant	600 μg / day	Xerophthalmia, Dry skin, impaired immunity, growth and reproduction	Retinol (animal foods): liver, egg, meat, milk Provitamin A (plant foods) yellow, green vegetables
Vitamin D (Cholecalciferol, D_3 ; Ergocalciferol, D_2)	Calcium homeostasis, Bone metabolism	100 - 400 IU /day - (Child)	Rickets in children Osteomalacia in adults	Synthesised in skin with exposure to sunlight; Fish oils, milk
Vitamin E (Tocopherols)	Cellular membrane antioxidant	12mg / day	RBC breakdown, anaemia, nerve damage, retinopathy	Vegetable oils, green vegetables, cereal germ, nuts, seeds
Vitamin K (Phylloquinones, Menaquinones, Menadione)	Clotting of blood, Calcium metabolism	120 μg / day (Males) 90 μg / day (Females)	Bleeding tendencies	Synthesis by intestinal bacteria, green vegetables soya oil, liver, milk

<i>Water Soluble Vitamins</i>				
Vitamin	Function	RDA	Deficiency	Sources
Vitamin C (Ascorbic acid)	Reductant in hydroxylations in collagen and carnitine synthesis Metabolism of drugs	40mg /day	Scurvy: Spongy, bleeding gums, fatigue, haemearthrosis	Citrus fruits, guava, amla, green vegetables , tomatoes, strawberries
Vitamin B₁ (Thiamine)	Normal growth Coenzyme for decarboxylation of 2-keto acids and transketolation reactions	0.5mg / 1000Kcal	Beriberi - Cardiac (wet), Neuritic (dry) and Infantile	Meat, liver, legumes, wheat germ
Vitamin B₂ (Riboflavin)	Normal growth Coenzyme in redox reactions of fatty acids and TCA cycle	0.6mg / 1000Kcal	Ariboflavinosis: Magenta tongue, Cheilosis, angular stomatitis, corneal ulcer	Milk, meat, green vegetables
Niacin (Nicotinic acid, Nicotinamide)	Coenzyme for dehydrogenases	6.6mg / 1000Kcal	Pellagra, characterized br 3 Ds- dermatitis, diarrhea, dementia	Meat, groundnus, legumes, grains
Vitamin B₆ (Pyridoxamine)	Coenzymes in amino acid metabolism	2mg / day	Anaemia, neuritis, convulsions	Grains, seeds, poultry, meat
Folic Acid	Coenzymes in single carbon metabolism	100µg / day	Megaloblastic anaemia	Liver, green vegetables yeast, fruits
Vitamin B₁₂ (Cobalamin)	Coenzymes in amino acid, propionate and single carbon fragment metabolism	1µg / day	Pernicious anaemia	Liver, lean meat fish, seafood, milk

Good eating habits

- Eating is regulated by hunger and satiety i.e. feeling full.
- Eating should be at regular intervals
- Choose healthy snacks and food.
 - Snacks like fresh fruits, sprouted beans and nuts are nutritious and healthy.
 - Avoid energy dense snacks like burgers.
 - “Empty calories” – High sugar drinks
 - Aerated drinks interfere with bone density and can damage teeth.

Balanced Diet

- The diet which contains **variety of foods** in such **quantities and proportions** that the need for energy, amino acids, vitamins, minerals, fats, carbohydrates & other nutrients is adequately met **for maintaining** health, vitality and general well-being and also make a small provision for **extra nutrient** to withstand short duration of leanness.



THANKS....